

Four-Area Demand Forecasts for Ontario (Quick Take)

Issue 1, February 2024

This issue of Quick Takes provides an overview of how the IESO's daily Demand Forecasts will be changing as a result of the Market Renewal Program (MRP), from a provincial Demand Forecast to a four-area Demand Forecast. It should be noted that any IESO reports related to demand or consumption of electricity which are published after the real-time market (ex-post) are not considered to be forecasts, and thus are outside the scope of this Quick Take.

Demand Forecasts

As part of market operations, the IESO produces Demand Forecasts every day to represent the anticipated electricity requirements needed for each hour throughout the dispatch day. These forecasts are based on the IESO's projections of anticipated demand by dispatchable loads, non-dispatchable loads and Local Distribution Companies (LDCs) and throughout Ontario (excluding exports to other jurisdictions). Market participants do not submit any forecast information as part of these projections. Demand Forecasts are used as one of the inputs to the calculation engines to ensure that enough generation is committed in advance to meet expected demand and reduce the chances of experiencing a shortfall in generated electricity.

The IESO publishes hourly electricity Demand Forecasts each day up to 34 days ahead of the applicable dispatch day based on historical demand by those loads in recent days/hours. The IESO also publishes forecasts for all 5-minute intervals during the Real-Time hour of the current dispatch day. Demand in Ontario varies throughout each day, rising and falling cyclically over many hours across a wide range. As a result, the IESO's Demand Forecasts will also vary, and are influenced by factors such as historical and forecasted weather and demand, calendar variables, embedded generation and many other drivers. A more detailed list of factors that are used as input drivers to the Demand Forecasts, can be found in the amended Market Manual 7.2 – Near Term Assessments and Reports -Appendix A, for MRP.

These factors combine to form a daily demand curve with cyclical patterns of consumption, but which also have unique variations each day. Despite these differences, the IESO's Demand Forecast is closely predictive of actual demand, and the Market Renewal Program (MRP)'s enhancements to the Demand Forecast are intended to make these forecasts even more accurate.

Improvements to the Demand Forecast Process

MRP’s introduction of Locational Marginal Prices (LMPs) and a financially-binding Day-Ahead Market will require greater accuracy and granularity in demand forecasting to ensure economic efficiency in the market, and to properly balance supply and demand in all market timeframes.

The IESO will implement the following changes to demand forecasting:

- Increasing the granularity of the forecasts into four forecast areas, to ensure that the LMPs are calculated based on a more localized Demand Forecast
- Adding data from more weather station locations
- Adding more weather data variables to the database
- Allowing variable generators to optionally submit their own telemetry data and/or forecasts, thus improving the forecasts of embedded generation impacts on local distribution grid data
- Developing new/improved models for demand forecasting

IESO’s Four-Area Demand Forecast Framework

Historically, the IESO has provided a single province-wide Demand Forecast for the entire Ontario electrical system. Market Renewal will be introducing a transition to a four-area Demand Forecast system, as shown in the diagram below. These four areas are based on combinations of the IESO’s existing 10 electrical zones, and are combined based on complementary characteristics.

Table 1 | Demand Forecast Areas – Location and Size

Demand Forecast Area	Electrical Zones contained	Average Hourly Demand (MW) for 2022-2023	% of Total System Load (2022-2023)
Northwest	Northwest	527	3%
Northeast	Northeast	1,224	8%
Southeast	East, Essa, Ottawa, Toronto	8,571	55%
Southwest	Bruce, Niagara, Southwest, West	5,414	34%
Total		15,736	100%

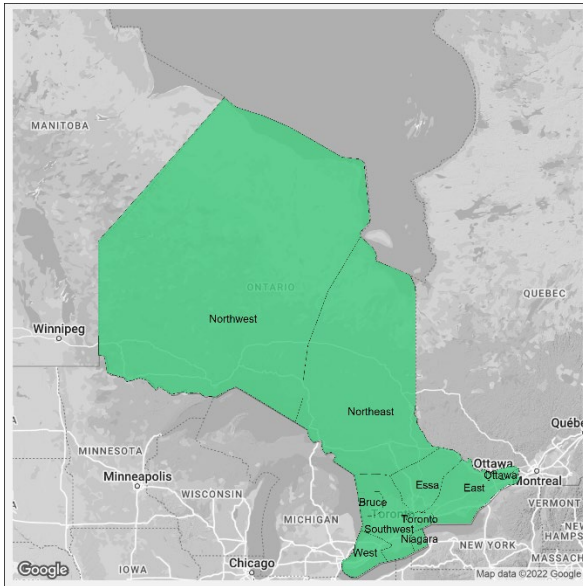


Figure 1 - One Forecast Area (2002-2024)

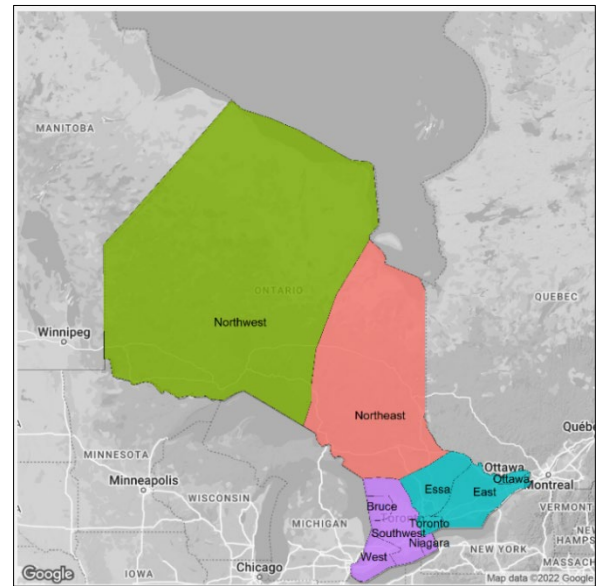


Figure 2 - Four Forecast Areas (2025 and after)

Amalgamation Rationale for the Four Demand Forecast Areas

The IESO created the four Demand Forecast Areas by grouping together electrical zones that would:

- reduce impacts of forecasting errors by
 - matching zones with similar levels of existing Day-Ahead forecasting error,
 - grouping larger numbers of generation resources together (scaling) to ensure telemetry error impacts are minimized,
- use weather data from adjacent electrical zones within the same area when sufficient local data is not available, and
- minimize the impact of locations of frequent transmission congestion on the forecast.

IESO Reports Containing Demand Forecast Data

The IESO will publish Demand Forecasts in 2 public reports:

- **Adequacy Report:** published multiple times during the day for the Dispatch Day (Day 0) and for the Day-Ahead (Day 1), and published twice a day for Days 2 to 34, providing detailed forecasts of load and available generation capacity, as well as information on resource outages. At any point in time, there are 35 Adequacy Reports in total which are the most-current for those 35 upcoming days. Each report provides hourly granularity of forecasted energy quantities, for one of the days in the 35-day assessment period. The Adequacy Report is expanding with the Market Renewal Program to also include the Demand Forecast for those same days, on an hourly granularity, for each of the new four Demand Forecast Areas. There will also be minor changes in daily publishing times for the Day 1-34 Adequacy Reports and no changes to the timing of the Day 0 Adequacy Report.

- **Real-Time Totals Report:** published every 5 minutes, providing a forecast of 5-minute total quantities (total energy, total losses, total load, total dispatchable load, and total operating reserve) scheduled, and Ontario Demand (one total value for the entire province, not by forecast area) for the upcoming interval of the dispatch hour in real-time. It reflects the demand data values being used by the IESO's Real-Time calculation engines for that 5-minute interval. Prior to Market Renewal, this report was titled the 'Real-Time Constrained Totals Report'.

The following report will be retired once market renewal becomes effective in 2025:

- **Ontario Zonal Demand Forecast:** published daily, for Day 0 to Day 34, showing the Demand Forecast for an entire province of Ontario, as well as for the East and West systems within the province. These forecasts will transition to the four-area framework in the modified Adequacy Report mentioned above.

Additional Resources

- **Sample Reports, Schemas and Help files** for the two reports containing Demand Forecasts (and for other reports) will be provided on the IESO's public Website (www.ieso.ca), to assist users in understanding the structure and layout of these Reports, how the IESO uses this information, and how users can interpret the data. Leading up to the MRP Go-live date, this information can be found at <https://www.ieso.ca/Market-Renewal/Market-Participant-Readiness/Technical-Reference-Materials>
- **IESO Market Manual 7: System Operation** – (Part 7.2: Near-Term Assessments and Reports) (MRP Version)
- **Details of the calculation engines' use of the Demand Forecasts** under MRP, can be found in the MRP-amended versions of Market Manual 4.2 section 3.2.5 (Operation of the Day Ahead Market) and Market Manual 4.3 section 2.3.2.5 and 3.3.3.5 (Operation of the Real-Time Markets), as well as Market Rules Chapter 7 Appendix 7.5, 7.5A, and 7.6.

Contact Us

Email any questions/clarifications related to this document to IESOCustomerRelations@ieso.ca

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